

Bhavathrathan *Bhattiyil Kuzhiyamkunnath*

Assistant Professor in Civil Engineering, Indian Institute of Technology Palakkad
bhavathrathan@iitpkd.ac.in • +91-4923-226-475 • iitpkd.ac.in/people/bhavathrathan

Experience

Indian Institute of Technology Palakkad Assistant Professor, Civil Engineering	PALAKKAD <i>Apr '18 – Present</i>
Singapore-MIT Alliance for Research and Technology Postdoctoral Associate, Future Urban Mobility	SINGAPORE <i>Nov '16 – Mar '18</i>
Indian Institute of Technology Bombay Research Associate, Department of Civil Engineering	MUMBAI <i>Jul '16 – Oct '16</i>
Royal College of Engineering and Technology Lecturer, Department of Civil Engineering	THRISSUR <i>Jul '08 – Jul '09</i>
Ramky Infrastructure Limited Graduate Engineer Trainee	HYDERABAD <i>Jul '07 – Jul '08</i>

Academic Profile

Indian Institute of Technology Bombay Ph. D. in Civil Engineering, Specialised in Transportation Systems Engineering	MUMBAI <i>Jul '11 – Jun '16</i>
Indian Institute of Technology Guwahati M. Tech. in Civil Engineering, Specialised in Transportation Systems Engineering	GUWAHATI <i>Jul '09 – Jul '11</i>
University of Calicut B. Tech. in Civil Engineering, Government Engineering College Thrissur	CALICUT <i>Jun '03 – Jun '07</i>

Research Exposure

During Postdoc: Urban Freight Transport, Commodity Flow, Offline Calibration of Large-scale Simulation

During PhD: Urban Road Networks, Network Resilience, Transportation Systems Optimization, Traffic Assignment, Critical Component Identification

During MTech: Traffic Flow Theory, Macroscopic Traffic Simulation, Heterogeneous Traffic, Numerical Schemes to Solve PDEs

Teaching and Teaching-Assistance

Teaching	
Royal College of Engineering and Technology	2008 - '09
CE04 505 Transportation Engineering I (3 hours lecture and 1 hour tutorial per week)	
CE04 504 Geotechnical Engineering I Module I (3 hours lecture and 1 hour tutorial per week)	
CE04 308(P) Material Testing Lab II (3 hours practical per week)	
EN04 107B Engineering Mechanics (B) (2 hours lecture and 1 hour tutorial per week)	
Teaching Assistance	
Indian Institute of Technology Bombay	2011 - '15
CE 744 Analysis of Transportation Systems	
CE 434 Traffic Analysis and Design	
CE 415 Transportation Engineering II	
CE 320 Transportation Engineering I	
CE 328 Transportation Engineering Lab I	
Indian Institute of Technology Guwahati	2009 - '11
CE 584 Traffic Flow Modelling and Simulation	
CE 581 Urban Transportation Systems Planning	
ME 111 Engineering Drawing	

In Refereed International Journals

Published

1. Bhavathrathan, B.K., and Patil G.R., "An algorithm to compute urban road network resilience", Accepted, *Transportation Research Record: Journal of the Transportation Research Board*, 2018.
2. Bhosale, M., Bhavathrathan, B.K., and Patil G.R., "Red Light Running at Heterogeneous Saturated Intersections in Mumbai, India: On the Existence of Two Regimes and Causal Factors", *Transportation Research Record: Journal of the Transportation Research Board* 2619 (2017) pp. 75 – 84 <https://doi.org/10.3141/2619-08>
3. Patil, G.R., and Bhavathrathan, B.K., "Effect of traffic demand variation on road network resilience", *Advances in Complex Systems* 19(1)(2016) <http://dx.doi.org/10.1142/S021952591650003X>
4. Bhavathrathan, B.K., and Patil, G.R., "Quantifying resilience using a unique critical cost on road networks subject to recurring capacity disruptions", *Transportmetrica A: Transport Science* 11(9)(2015) pp. 836 – 855, Taylor & Francis. <http://dx.doi.org/10.1080/23249935.2015.1087230>
5. Bhavathrathan, B.K., and Patil, G.R., "Capacity uncertainty on urban road networks: A critical state and its applicability in resilience quantification", *Computers, Environment and Urban Systems* 54 (2015) pp. 108 – 118, Elsevier. <http://dx.doi.org/10.1016/j.compenvurbsys.2015.07.005>
6. Chunchu, Mallikarjuna, and Bhavathrathan, B.K., "Analysis of the effect of two-wheeler lane-sharing behavior on macroscopic traffic flow modeling", *Transport* 29 (2) (2014) pp. 146 – 153 <http://dx.doi.org/10.3846/16484142.2014.928788>
7. Bhavathrathan, B.K., and Chunchu, Mallikarjuna, "Evolution of macroscopic models for modeling the heterogeneous traffic: An Indian perspective", *Transportation Letters* 4 (1) (2012) pp. 29 – 39 <doi/abs/10.3328/TL.2012.04.01.29-39>

Under Review

8. Sakai T., Bhavathrathan, B.K., Alho A., Hyodo T., and Ben-Akiva M., "Commodity flow estimation for a metropolitan scale freight modeling system: supplier selection considering distribution channel using an error component logit mixture model", Submitted to *Transportation*, 2018.

In Elsevier Procedia

9. Sultania G., Bhavathrathan, B. K. and Patil G.R. "Analysing risk associated with multiple simultaneous disruptions on urban roads". *Transportation Research Procedia* 17 (2016) pp. 539 -547 <https://doi.org/10.1016/j.trpro.2016.11.108>
10. Bhavathrathan, B.K., and Patil, G.R. "Analysis of worst case stochastic link capacity degradation to aid assessment of transportation network reliability", *Procedia-Social and Behavioral Sciences* 104 (2013), pp. 507 - 515 <http://dx.doi.org/10.1016/j.sbspro.2013.11.144>

At International Conferences

International Conferences Held Abroad

1. Bhavathrathan, B.K., and Patil G. R., "An algorithm to compute urban road network resilience", Accepted for presentation at *Transportation Research Board 97th Annual Meeting*, January 2018, Washington DC.
2. Sakai T., Bhavathrathan, B.K., Alho A., Hyodo T., and Ben-Akiva M., "Urban Freight Distribution considering Logistics Chain Structure: Selection of Supplier with Distribution Channel", Accepted for presentation at *Transportation Research Board 97th Annual Meeting*, January 2018, Washington DC.
3. Alho, A., Bhavathrathan, B. K., Stinson, M., Gopalakrishnan, R., Le, D., Ben-Akiva, M. "A multi-scale agent-based modelling framework for urban freight distribution", Accepted for presentation at *20th EURO Working Group on Transportation Meeting*, September 2017, Budapest, Hungary
4. Bhosale, M., Bhavathrathan, B.K., and Patil G.R., "Two regimes of red-light-running at heterogeneous, saturated intersections: A field investigation in Mumbai, India", Presented at *Transportation Research Board 96th Annual Meeting*, January 2017, Washington DC.
5. Bhavathrathan, B. K., and Patil, G. R., "Stochastic tolling to achieve long-run system optimum under tolerance-based probabilistic user equilibrium." Presentation at the *14th World Conference on Transportation Research*, July 2016, Shanghai, China. Available online at <https://wctrs.conference-services.net/view-file.asp?sessionID=&abstractID=863926&conferenceID=3909&abstractName=paper>
6. Patil, G.R., and Bhavathrathan, B.K., "A Game-Theoretic Model to Identify Critical Links on Urban Road Networks", *Transportation Research Board 95th Annual Meeting* 16-5213, January 2016, Washington DC. Available online at <http://amonline.trb.org/trb60693-2016-1.2807374/t001-1.2823436/264-1.2823590/16-5213-1.2981771/16-5213-1.2993251?qr=1>
7. Bhavathrathan, B. K., Madhusoodhanan, C. G., Patil, G. R., and Eldho, T.I. "Climate change impacts on coastal urban road networks: A methodological approach." International Conference on Climate Change Innovation and Resilience for Sustainable Livelihood (*ClimDev15*), January 2015, Kathmandu, Nepal. Available online at <https://smallearthnepal.files.wordpress.com/2014/06/proceeding.pdf>

8. Patil, G.R., and Bhavathrathan, B.K., "Investigating the sensitivity of road network resilience to demand variability", *Transportation Research Board 94th Annual Meeting* 15-4173, January 2015, Washington DC, USA. Available online at <http://docs.trb.org/prp/15-4173.pdf>
9. Bhavathrathan, B.K., and Patil, G.R. "A critical state of multiple simultaneous link disruptions", *Transportation Research Board 93rd Annual Meeting* 14-4351, January 2014, Washington DC, USA. Available online at <http://amonline.trb.org/trb-55856-2014a-1.823612/t-1134-1.870386/234-1.877005/14-4351-1.877014/14-4351-1.877018?qr=1>
10. Bhavathrathan, B.K., and Patil, G.R. "Modelling network degradation using game theory- Optimal strategies at Nash equilibrium", *13th World Conference on Transportation Research*, July 2013, Rio de Janeiro, Brazil. Available online at <http://www.wctrs-society.com/wp/wp-content/uploads/abstracts/rio/selected/3076.pdf>

International Conferences Held in India

11. Bhavathrathan, B. K., and Patil, G. R., "Identifying tipping-points of disruptions on urban road networks." Presented at the *Transportation Planning and Implementation Methodologies for Developing Countries*, December 2016, Mumbai, India.
12. Bhavathrathan, B. K., and Patil, G. R., "Urban transportation demand management: A review of strategies, modelling frameworks, and case studies." *3rd Conference of the Transportation Research Group of India*, December 2015, Delhi, India.
13. Sultania, G., Bhavathrathan, B. K., and Patil, G. R., "Quantifying risk due to capacity uncertainty on urban road networks." *11th Transportation Planning and Implementation Methodologies for Developing Countries*, December 2014, Mumbai, India.
14. Bhavathrathan, B. K., and Patil, G. R., "Analysis of worst case stochastic link capacity degradation to aid assessment of transportation network reliability." *2nd Conference of the Transportation Research Group of India*, December 2013, Delhi, India.
15. Bhavathrathan, B. K., and Patil, G. R., "Modelling worst-operable-case on urban networks due to stochastic link capacity degradations." *10th Transportation Planning and Implementation Methodologies for Developing Countries*, December 2012, Mumbai, India.

At National Conferences

1. Bhavathrathan, B. K., and Patil, G. R., "Investigating demand-sensitivity and establishing a generalized index of transportation network resilience." *Colloquium on Transportation Systems Engineering and Management*, May 2014, Kozhikode, India.
2. Bhavathrathan, B. K., and Patil, G. R., "Minimax optimization to analyze worst-case of transportation networks." *Recent Advances in Civil Engineering*, April 2013, Belgaum, India.

Professional Activities

Organizing Academic Events

- Overall Coordinator (Students'), TPMDC '14:** International Conference on Transportation Planning and Implementation Methodologies in Developing Countries (TPMDC 2014), IIT Bombay, Mumbai, December 10-12, 2014
- Assisted in organizing UFT Workshop:** An Indo-US workshop on Urban Freight Transport: A Global Perspective, Jointly organized by IIT Bombay and VREF Center of Excellence for Sustainable Urban Freight Systems, Rensselaer Polytechnic Institute, Troy, New York at IIT Bombay, April 9-10, 2014
- Assisted in conducting IUT Meeting:** Workshop on Transit-Oriented Development by Institute of Urban Transport (India) Western region Chapter at IIT Bombay, September 24, 2013
- Assisted in organizing CE&QIP Course:** Continuous Education (CE) & Quality Improvement Program (QIP) Short Term Course on Transportation Demand Modeling at IIT Bombay during June 17-21, 2013
- Scientific Committee (Students') and Delegate Relation, TPMDC '12:** International Conference on Transportation Planning and Implementation Methodologies in Developing Countries (TPMDC 2012), IIT Bombay, Mumbai, December 12-14, 2012
- Assisted in organizing InTranse 2011:** International Conference on Intelligent Transportation Systems (InTranSe 2011) jointly organized by IIT Bombay and Centre for Development of Advanced Computing (C-DAC) Thiruvananthapuram at IIT Bombay, October, 2011

Reviewing & Refereeing

- ADB30 Committee of TRB:** Member of the ADB30 (Transportation Network Modeling Committee) reviewer pool for Transportation Research Board Annual Meeting, Washington D.C.

Transportmetrica A: Transport Science Published by Elsevier

Transportation Letters: the International Journal of Transportation Research, published by Maney & J. Ross.

Reliability Engineering & System Safety: Published by Elsevier in association with the European Safety and Reliability Association, and the Safety Engineering and Risk Analysis Division

Journal of Urban Technology: Published by Taylor & Francis

EWGT: European Working Group on Transportation

CTRG: Conference of Transportation Research Group of India

TPMDC: International Conference on Transportation Planning and Implementation Methodologies in Developing Countries

Consultancy Projects

Vehicular Congestion and Emissions Analysis: Assisted in vehicular congestion and emissions analysis of a proposed township 'Rising City' in Mumbai. PI: Prof. Gopal R. Patil, IIT Bombay, October 2015

Professional Membership

MISTE: Life member, Indian Society for Technical Education, since 2008